A problem (Associated with a problem solving agent) consists of:

- Initial state
- a set of possible actions given a state & a successor function with maps an action and a state to a new state. (state space)
- a goal test (to check if problem is solved)
- a cost associated with performing a given action. Induces a cost associated with a path in the state space. (a sequence of (action, states))

Example Problems

8-puzzle

7	2	1
5		6
8	3	1

States – description of the location of each of 8 tiles.
The initial state – the position we want to solve from
Successor function – Choose hole up, left, right, down, but hole stays on board.
Goal Test – Does the board look like (final solution)
Path Cost – 1 for each move of hole in path.

	1	2
3	4	5
6	7	8

8-Queens Problem
States – any arrangement of 0 to 8 queens on a chess board.
Initial State – no queens on the board.
Successor function – add a queen to an empty square.
Goal Test – 8 queens on the board none attacking each other.

Above state space could be as large as 64 * 63 * 62 * 61 * 60 * 59 * 58 * 57

Can reduce search space by requiring newly placed queens not to be attackable by existing queens. (2,057 possible)